Federal Democratic Republic of Ethiopia

EDICT OF GOVERNMENT

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ET 653 (2001) (English): Recommended code of hygienic practice for the collecting, processing and marketing of mineral waters

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ETHIOPIAN STANDARD

ES 653:2001

(Reaffirmed :2012)

First edition

Recommended code of hygienic practice for the collecting, processing and marketing of mineral waters

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Foreword

This Ethiopian Standard has been prepared under the direction of the Technical Committee for Food Products in general (TC 91) and published by the Ethiopian Standards Agency (ESA).

The standard is a reaffirmation for reprint of the Ethiopian Standard ES 653:2001 recommended code of hygienic practice for the collecting,processing and marketeing of mineral waters, with some editorial changes without altering the technical contents in the former text.

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Recommended code of hygienic practice for the collecting, processing and marketing of mineral waters

1 Scope

This Ethiopian Standard specifies the recommended code of hygienic practice for the collecting, processing and marketing of mineral waters.

2 Normative reference

The following standard contains provisions which, through reference to this text, constitute provisions of this Ethiopian Standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this Ethiopian Standard are encouraged to investigate the possibility of applying the most recent edition of the Ethiopian Standard indicated below. Registers of currently valid standards are maintained in the Ethiopian Standards Agency.

ES 621, *Mineral* waters – *Specification.*

3 Definitions

For the purpose of this standard, the following definitions shall apply:

3.1
mineral waters
the definition in ES 621 shall apply

3.2
adequate
sufficient to accomplish the intended purpose of this code

3.3
cleaning
the removal of soil, food residues, dirt, grease or other objectionable matter

3.4
contamination
the occurrence of any objectionable matter in the product

3.5
disinfection
the reduction, without adversely affecting the mineral water, by means of hygienically satisfactory chemical agents and/or physical methods, of the number of microorganisms to a level that will not lead to harmful contamination of mineral water

3.6
establishment
any building or area in which mineral water is handled after collection and the surroundings under the control of the same management

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3.7
handling of mineral water
any manipulation with regard to collecting, treating, bottling, packaging, storing, transport, distribution and sale of mineral water

3.8
food hygiene
all measures necessary to ensure the safety, soundness and wholesomeness of mineral water at all stages from its exploitation and processing until its final consumption

3.9
packaging material
any containers such as cans, bottles, cartons, boxes, cases or wrapping and covering material such as foil, film, metal paper and wax-paper

3.10
pests
any animal capable of directly or indirectly contaminating mineral water

3.11
containers
any bottle, carton, can or other container to be filled with natural mineral water

3.12
aquifers
any solid permeable mass of rocks (layer) containing mineral water

3.13
spring
any mineral water discharging genuinely from the ground.

4 Prescriptions of the resources of mineral waters

Protection of alimentary reservoirs and aquifers

4.1 Authorization

Any spring, well or drilling intended for the collection of mineral water should be approved by the Ministry of Health and Ministry of Mines and Energy.

4.2 Determination of the genesis of mineral water

As far as it is methodologically possible in each case, a precise analysis should be carried out on the origin of mineral waters, the period of their residence in the ground before being collected and their chemical and physical qualities.

4.3 Perimeter of protection

If possible areas mineral water might be polluted or its chemical and physical qualities otherwise deteriorated should be determined by a hydrologist. Where indicated by hydrogeological conditions and considering the risks of pollution and physical, chemical and biochemical reactions several perimeters with separate dimensions may be provided for.

4.4 Protective measures

All possible precautions should be taken within the protected perimeters to avoid any pollution of, or external influence on, the chemical and physical qualities of mineral water.

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It is recommended that regulations be established for the disposal of liquid, solid or gaseous waste, the use of substances that might deteriorate mineral water (e.g. by agriculture) as well as for any possibility of accidental deterioration of mineral water by natural occurrences such as change in the hydrogeological conditions. Particular consideration should be given to the following potential pollutants : bacteria, viruses, fertilizers, hydrocarbons, detergents, pesticides, phenolic compounds, toxic metals, radioactive substances and other soluble organic or inorganic substances. Even where nature provides apparently sufficient protection against surface pollution, potential hazards should be taken into consideration, such as mining, hydraulic and engineering facilities etc.

4.5 Hygiene prescriptions for the collection of mineral water

4.5.1 Extraction

The withdrawal of mineral water (from springs, galleries, genuine or drilled wells) must be performed in conformity with the hydrogeological conditions in such a manner as to prevent any other than the mineral water from entering or should there be pumping facilities, prevent any extaneous water from entering by reducing the supply. The mineral water thus collected or pumped should be protected in such a way that it will be safe from pollution whether caused by natural occurrence or actions or neglected or ill will.

4.5.2 Materials

The pipes, pumps or other possible devices coming into contact with mineral water and used for its collection should be made of such materials as to guarantee that the original qualities of mineral water will not be changed.

4.5.3 Protection of the extraction area

In the immediate surroundings of springs and wells, precautionary measures should be taken to guarantee that no pollutant whatsoever can enter the extraction area. The extraction area should be inaccessible to non-authorized people by providing adequate devices (e.g. enclosure). Any use not aiming at the collection of mineral water should be forbidden in this area.

4.5.4 The exploitation of mineral water

The condition of the extraction facilities, areas of extraction and perimeters of protection as well as the quality of the mineral water should periodically be checked. To control the stability of the chemical and physical particulars of the mineral water derived-besides the natural variations-automatic measurements of the typical characteristics of water should be carried out and notified (e.g. electrical conductance, temperature, content of carbon dioxide) or frequent partial analyses should be done.

4.6 Maintenance of extraction facilities

4.6.1 Technical aspects

Methods and procedures for maintaining the extraction facilities should be hygienic and not be a potential health hazard to humans or a source of contamination to mineral water. From the hygiene standpoint, servicing of the extraction installations should meet the same standards as those required for the bottling or treatment.

4.6.2 Equipment and reservoirs

Equipment and reservoirs used for extraction of mineral water should be constructed and maintained in order to minimize all hazards to human health and to avoid contamination.

4.6.3 Storage at the point of extraction

The quantity of mineral water stored at the point of extraction should be as low as possible. The storing should furthermore guarantee protection against contamination of deterioration.

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4.7 Transport of mineral water

4.7.1 Means of transport, piping and reservoirs

Any vehicle, piping or reservoir used in the processing of mineral water from its source to the bottling facilities, the latter included, should comply with the necessary requirements and be made of inert material such as ceramic and stainless steel which prevent any deterioration, be it by water, handling, servicing or disinfection: it should allow easy cleaning.

4.7.2 Maintenance of vehicles and reservoirs

Any vehicle or reservoir should be properly cleaned and if necessary disinfected and kept in good repair so as not to present any danger of contamination to mineral water and of deterioration of the essential qualities of mineral water.

5 Establishment for processing mineral water – Design and facilities

5.1 Location

Establishments should be located in areas, which are free from objectionable odours, smoke, dust or other contaminants and are not subject to flooding.

5.2 Roadways and areas used by wheeled traffic

Such roadways and areas serving the establishment which are within its boundaries or in its immediate vicinity should have a hard paved surface suitable for wheeled traffic. There should be adequate drainage and provision should be made for protection of the extraction area in accordance with sub-section 4.5.3 where appropriate and to allow for cleaning. Adequate road signals may be provided to call the attention of road users to the existence of a mineral water extraction area.

5.3 Buildings and facilities

5.3.1 Type of construction

Buildings and facilities should be of sound construction in accordance with the provisions of sub-section 4.5.3 and maintained in good repair.

5.3.2 Disposition of holding facilities

Rooms for recreation, for storing or packaging of raw material and areas for the cleaning of containers to be re-used should be apart from the bottling areas to prevent the end-product from being contaminated. Raw and packaging materials and any other additions, which come into contact with mineral water, should be stored apart from other material.

5.3.3 Adequate working space should be provided to allow for satisfactory performance of all operations.

5.3.4 The design should be such as to permit easy and adequate cleaning and to facilitate proper supervision of mineral water hygiene.

5.3.5 The buildings and facilities should be designed to provide separation by partition, location or other effective means between those operations, which may cause cross- contamination.

5.3.6 Buildings and facilities should be designed to facilitate hygienic operations by means of a regulated flow in the process from the arrival of the mineral water at the premises to the finished product, and should provide for appropriate temperature conditions for the process and the product.

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5.3.7 Mineral water handling, storing and bottling areas

***Floors*,** where appropriate, should be of waterproof, non-absorbent, washable, non-slip and non-toxic materials, without crevice, and should be easy to clean and disinfect. Where appropriate, floors should slope sufficiently for liquids to drain to trapped outlets.

Walls, where appropriate, should be of waterproof, non-absorbent, washable and non-toxic materials and should be light colour. Up to a height appropriate for the operation they should be smooth and without crevices, and should be easy to clean and disinfect. Where appropriate, angles between walls, between walls and floors, and between walls and ceilings should be sealed and coved to facilitate cleaning.

Ceilings should be so designed, constructed and finished as to prevent the accumulation of dirt and minimize condensation, mould development and flaking, and should be easy to clean

Windows and other openings should be so constructed as to avoid accumulation of dirt and those which open should be fitted with screens. Screens should be easily movable for cleaning and kept in good repair. Internal window sills, if present, should be sloped to prevent use as shelves.

Doors should have smooth, non-absorbent surfaces and, where appropriate, be self-closing and close fitting.

Stairs, lift cages and auxiliary structures such as platforms, ladders, chutes, should be so situated and constructed as not to cause contamination to food. Chutes should be constructed with inspection and cleaning hatches.

Piping for mineral water lines should be independent of potable and non-potable waters.

5.3.8 In mineral waters handling areas all overhead structures and fittings should be installed in such a manner as to avoid contamination directly or indirectly of mineral water and raw materials by condensation and drip, and should not hamper cleaning operations. They should be insulated where appropriate and be so designed and finished as to prevent the accumulation of dirt and to minimize condensation, mould development and flaking. They should be easy to clean.

5.3.9 Living quarters, toilets and areas where animals are kept should be completely separated from and should not open directly on to mineral water handling areas.

5.3.10 where appropriate, establishments should be so designed that access can be controlled.

5.3.11 The use of material which cannot be adequately cleaned and disinfected, such as wool, should be avoided unless its use would clearly not be a source of contamination.

5.3.12 Canalization, drainage lines

Canalization and drainage and used water lines as well as any possible waste storage area within the protected perimeter should be built and maintained in such a manner as not to present any risk whatsoever of polluting aquifers and springs.

5.3.13 Fuel storage area

Any storage area or tank for the storing of fuels such as coal or hydrocarbons should be designed, protected, controlled and maintained in such a manner as not to present a risk of aquifers and springs being polluted during the storage and manipulation of these fuels.

5.4 Hygienic facilities

5.4.1 Water supply

An ample supply of potable water under adequate pressure and of suitable temperature should be available with adequate facilities for its storage, where necessary, and distribution, and with adequate protection against contamination. The standards of portability should not be less than those contained in the ES 261.

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Mineral water, potable water, non potable water for steam production or for refrigeration or any other use should be carried in completely separate lines with no cross connection between them and without back siphonage. It would be desirable that these lines be identified by different colours. Steam used in direct contact with mineral water and mineral water contact surfaces should contain no substances, which may be hazardous to health or may contaminate the food.

5.4.2 Effluent and waste disposal

Establishment should have an efficient effluent and waste disposal system, which should at all times be maintained in good order and repair. All effluent lines (including sewer systems) should be large enough to carry peak loads and should be so constructed as to avoid contamination of potable water supplies.

5.4.3 Changing facilities and toilets

Adequate, suitable and conveniently located changing facilities and toilets should be provided in all establishments. Toilets should be so designed as to ensure hygienic removal of waste matter. These areas should be well lit, ventilated and where appropriate heated, and should not open directly on to mineral water handling areas. Hand washing facilities with warm or hot and cold water, a suitable hand-cleaning preparation, and with suitable hygienic means of drying hands, should be provided adjacent to toilets and in such a position that the employee must pass them when returning to the processing area. Where hot and cold water are available mixing taps should be provided. Where paper towels are used, a sufficient number of dispensers and receptacles should be provided near to each washing facility. Care should be taken that these receptacles for used paper towels are regularly emptied. Tabs of a non-hand operable type are desirable. Notices should be posted directing personnel to wash their hands after using the toilet.

5.4.4 Hand washing facilities in mineral water processing areas

Adequate and conveniently located facilities for hand washing and drying should be provided wherever the process demands. Where appropriate, facilities for hand disinfection should also be provided. Warm or hot and cold water and suitable hand – cleaning preparation should be provided. Where hot and cold water are available mixing taps should be provided. There should be suitable hygienic means of drying hands. Where paper towels are used, a sufficient number of dispensers and receptacles should be provided adjacent to each washing facility. Taps of a non-hand operable type are desirable. The facilities should be furnished with properly trapped waste pipes leading to drains.

5.4.5 Disinfection facilities

Where appropriate, adequate facilities for cleaning and disinfection of working implements and equipment should be provided. These facilities should be constructed of corrosion resistant materials, capable of being easily cleaned, and should be fitted with suitable means of supplying hot and cold water in sufficient quantities.

5.4.6 Lighting

Adequate natural or artificial lighting should be provided throughout the establishment. Where appropriate, the lighting should not alter colours and the intensity should not be less than:

540 lux (50 foot candles) at all inspection points

220 lux (20 foot candles) in work rooms

110 lux (10 foot candles) in other areas.

Light bulbs and fixtures suspended over mineral water in any stage of production should be of a safety type and protected to prevent contamination of mineral water in case of breakage.

5.4.7 Ventilation

Adequate ventilation should be provided to prevent excessive heat, steam condensation and dust and to remove contaminated air. The direction of the air flow should never be from a dirty area to a clean area. Ventilation openings should be provided with a screen or other protecting enclosure of non-corrodible material. Screens should be easily removable for cleaning.

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5.4.8 Facilities for storage of waste and inedible material

Facilities should be provided for the storage of waste and indelible material prior to removal from the establishment. These facilities should be designed to prevent access to waste or inedible material by pests and to avoid contamination of natural mineral water, potable water, equipment, buildings or roadways on the premises.

5.5 Equipment and utensils

5.5.1 Materials

All equipment and utensils used in mineral water handling areas and which may contact the mineral water should be made of material which does not transmit toxic substances, odour or taste, is non-absorbent, is resistant to corrosion and is capable of withstanding repeated cleaning and disinfection. Surfaces should be smooth and free from pits and crevices. The use of wool and other materials which cannot be adequately cleaned and disinfected should be avoided except when their use would clearly not be a source of contamination. The use of different materials in such a way that contact corrosion can occur should be avoided.

5.5.2 Hygienic design, construction and installation

All equipment and utensils should be so designed and constructed as to prevent hygienic hazards and permit easy and thorough cleaning and disinfection.

6 Establishment : Hygiene requirements

6.1 Maintenance

The building, equipment, utensils and all other physical facilities of the establishment, including drains, should be maintained in good repair and in an orderly condition. As far as practicable, rooms should be kept from steam, vapour and surplus water.

6.2 Cleaning and disinfection

Cleaning and disinfection should meet the requirements of this Code.

To prevent contamination of mineral water, all equipment and utensils should be cleaned as frequently as necessary and disinfected whenever circumstance demand.

Adequate precautions should be taken to prevent mineral water from being contaminated during cleaning or disinfection of rooms, equipment or utensils, by water and detergents or by disinfectants and their solutions. Detergents and disinfectants should be suitable of the purpose intended and should be acceptable to the official agency having jurisdiction. Any residues of these agents on a surface which may come in contact with mineral water should be removed by thorough rinsing with water.

Either immediately after cessation of work for the day or at such other times as may be appropriate, floors, including drains, auxiliary structures and walls of mineral water handling areas should be thoroughly cleaned.

Changing facilities and toilets should be kept clean at all times.

Roadways and yards in the immediate vicinity of and serving the premises should be kept clean.

6.3 Hygiene control programme

A permanent cleaning and disinfection schedules should be drawn up for each establishment to ensure that all areas are appropriately cleaned and that critical area, equipment and material are designated for special attention. A single individual, who should preferably be a permanent member of the staff of the establishment and whose duties should be independent of production, should be appointed to be responsible for the cleanliness of the establishment. He should have a thorough understanding of the significance of contamination and the hazards involved. All cleaning personnel should be well-trained in cleaning techniques.

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6.4 Storage and disposal of waste

Waste material should be handled in such a mangers as to avoid contamination of mineral water or potable water. Care should be taken to prevent access to waste by pests. Waste should be removed from the mineral water handling and other working areas as often as necessary and at least daily. Immediately after disposal of the waste, receptacles used for storage and any equipment, which has come into contact with the waste, should be cleaned and disinfected. The waste storage area should also be cleaned and disinfected.

6.5 Exclusion of animals

Animals that are uncontrolled or that could be a hazard to health should be excluded from establishments.

6.6 Pest control

These should be an effective and continuous programme for the control of pests. Establishments and surrounding areas should be regularly examined for evidence of infestation.

Should pests gain entrance to the establishment, eradication measures should be instituted. Control measures involving treatment with chemical, physical or biological agents should only be undertaken by or under direct supervision of personnel who have a thorough understanding of the potential hazards to health resulting from the use of these agents, including those hazards which may arise from residues retained in recommendations of the official agency having jurisdiction.

Pesticides should only be used if other precautionary measures cannot be used effectively. Before pesticides are applied, care should be taken to safeguard mineral water, equipment and utensils from contamination. After application, contaminated equipment and utensils should be thoroughly cleaned to remove residues prior to being used again.

6.7 Storage of hazardous substances

Pesticides or other substances which may represent a hazard to health should be suitably labelled with a warning about their toxicity and use. They should be stored in locked rooms or cabinets used only for that purpose and dispensed and handled only by authorized and properly trained personnel or by persons under strict supervision of trained personnel. Extreme care should be taken to avoid contaminating mineral water.

Except when necessary for hygienic or processing purposes, no substance which could contaminate mineral water should be used or stored in mineral water handling areas.

6.8 Personal effects and clothing

Personal effects and clothing should not be deposited in mineral water handling areas.

7 Personnel hygiene and health requirements

7.1 Hygiene training

Managers of establishments should arrange for adequate and continuing training of all mineral water handlers in hygienic handling of natural water and in personal hygiene so that they understand the precautions necessary to prevent contamination of mineral water. Instructions should include relevant parts of this code.

7.2 Medical examination

Persons who come into contact with mineral water in the course of their work should have a medical examination prior to employment if the official agency having jurisdiction, acting on medical advice, considers that this is necessary, whether because of epidemiological considerations or the medical history of the prospective mineral water handler. Medical examination of natural mineral water handlers should be carried out at other times when clinically or epidemiologicaly indicated.

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7.3 Communicable diseases

The management should take care to ensure that no person, while known or suspected to be suffering from, or to be a carrier of a disease likely to be transmitted through food or while afflicted with infected wounds, skin infections, sores or with diarrhea, is permitted to work in any mineral water handling area in any capacity in which there is any likelihood of such a person directly or indirectly contaminating natural mineral water with pathogenic micro-organisms. Any person so affected should immediately report to the management that he is ill.

7.4 Injuries

Any person who has a cut or wound should not continue to handle mineral water or natural mineral water contact surfaces until the injury is completely protected by a waterproof covering which is firmly secured, and which is conspicuous in colour. Adequate first-aid facilities should be provided for this purpose.

7.5 Washing of hands

Every person, while on duty in a mineral water handling area, should wash his hands frequently and thoroughly with a suitable hand cleaning preparation under running warm water. Hands should always be washed before commencing work, immediately after using the toilet, after handling contaminated material and whenever else necessary. After handling any material which might be capable of transmitting disease, hands should be washed and disinfected immediately. Notices requiring hand-washing should be displayed. There should be adequate supervision to ensure compliance with this requirement.

7.6 Personal Cleanliness

Every person engaged in a mineral water handling area should maintain a high degree of personal cleanliness while on duty, and should at all times while so engaged wear suitable protective clothing including head covering and footwear, all of which should be clearable unless designed to be disposed of and should be maintained in a clean condition consistent with the nature of the work in which the person is engaged. Aprons and similar items should not be washed on the floor. During periods where mineral water is manipulated by hand, any jewelry that can not be adequately disinfected should be removed from the hands. Personnel should not wear any insecure jewelry when engaged in mineral water handling.

7.7 Personal Behavior

Any behavior which could result in contamination of mineral water, such as eating, use of tobacco, chewing (e.g. gum, sticks, betel nuts, etc.) or unhygienic practices such as spitting, should be prohibited in mineral water handling areas.

7.8 Visitors

Precautions should be taken to prevent visitors to mineral water handling areas from contaminating the product. These may include the use of protective clothing. Visitors should observe the provisions recommended in paragraphs 6.8,7.3,7.4 and 7.7 of this code.

7.9 Supervision

Responsibility for ensuring compliance by all personnel with all requirements of Sections 7.1, 7.8 inclusive should be specifically allocated to competent supervisory personnel.

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8 Establishment: Hygienic Processing Requirements

8.1 Raw Material Requirements

To guarantee a good and stable quality of mineral water, certain criteria should be monitored regularly, e.g.

Spring discharge, temperature of the mineral water;

Appearance of the mineral water;

Odor and taste of the mineral water;

The conductance of mineral water or any other adequate parameter;

The microbiological flora.

Should there be a perceptible lack in meeting the standards, the necessary corrective measures are immediately to be taken.

8.2 Treatment

The treatment may include decapitation, filtration, airing and where necessary application of off take of carbon dioxide (CO_2).

Processing should be supervised by technically competent personnel.

All steps in the production process, including packaging, should be performed without unnecessary delay and under conditions which will prevent the possibility of contamination, deterioration, or the development of pathogenic and spoilage micro-organisms.

Rough treatment of containers should be avoided to prevent the possibility of contamination of the processed product.

Treatment and necessary controls should be such as to protect against contamination or development of a public health hazard and against deterioration within the limits of good commercial practice.

All contaminated equipment which has been in contact with raw materials should be thoroughly cleaned and disinfected prior to being used in contact with the end-products.

8.3 Packaging material and Containers

All packaging material should be stored in a clean and sanitary manner. The material should be appropriate for the product to be packed and for the expected conditions of storage and should not transmit to the product objectionable substances beyond the limits acceptable to the official agency having jurisdiction. The packaging material should be sound and should provide appropriate protection from contamination. Only packaging material required for immediate use should be kept in the packing of filling area.

Product containers should not have been used for any purpose that may lead to contamination of the product. Used containers, also new containers if there is a possibility that they have been contaminated, should be cleaned and disinfected. When chemicals are used for these purposes, the container should be rinsed as prescribed under 5.2.3. Containers should be well drained after rinsing. Used and, when necessary, unused containers should be inspected immediately before filling.

8.4 Filling and Sealing of Containers

Packaging should be done under conditions that preclude the introduction of contaminants into the product.

The methods, equipment and material used for sealing should guarantee a tight and impervious sealing and not damage the containers nor deteriorate the chemical, bacteriological and organoleptic qualities of mineral water.

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8.5 Packaging of Containers

The packaging of containers should protect the latter from contamination and damage and allow appropriate handling and storing.

8.6 Lot identification

Each container shall be permanently marked in code or in clear to identify the producing factory and the lot. A lot is a quantity of mineral water produced under identical conditions, all packages of which should bear a lot number that identifies the production during a particular time interval, and usually from a particular "line" or other critical processing unit.

8.7 Processing and Production Records

Permanent, legible and dated records of pertinent processing and production details should be kept concerning each lot. These records should be retained for a period that exceeds the shelf life of the product. Records should also be kept of the initial distribution by lot.

8.8 Storage and Transport of the End - Product

The end-product should be stored and transported under such conditions as will preclude contamination with and/or proliferation of microorganisms and protect against deterioration of the product or damage to the container. During storage, periodic inspection of the end-product should take place to ensure that only mineral water, which is fit for human consumption, is dispatched and that end-product specifications should be complied with when they exist.

8.9 Sampling and Laboratory Control Procedure

The following are intended as guidelines for testing the water at the source and at critical control points:

Mineral water should contain no parasites and should meet the requirements specified in ES 621.

8.9.1 End-product Specifications

During marketing, mineral water:

1. Shall be of such a quality that it will not represent a risk to the health of the consumer (absence of pathogenic micro-organisms).
2. Furthermore it shall be in conformity with the microbiological specifications mentioned in ES 621.

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Ethiopian Standards Agency

Organization and Objectives

The Ethiopian Standards Agency (ESA) is the national standards body of Ethiopia established in 2010 based on regulation No. 193/2010.ESA is established due to the restructuring of Quality and Standards Authority of Ethiopia (QSAE) which was established in 1970.

ESA's objectives are:-

- ❖ Develop Ethiopian standards and establish a system that enable to check weather goods and services are in compliance with the required standards,
- ❖ Facilitate the country's technology transfer through the use of standards,
- ❖ Develop national standards for local products and services so as to make them competitive in the international market.

Ethiopian Standards

The Ethiopian Standards are developed by national technical committees which are composed of different stakeholders consisting of educational Institutions, research institutes, government organizations, certification, inspection, and testing organizations, regulatory bodies, consumer association etc. The requirements and/ or recommendations contained in Ethiopian Standards are consensus based that reflects the interest of the TC representatives and also of comments received from the public and other sources. Ethiopian Standards are approved by the National Standardization Council and are kept under continuous review after publication and updated regularly to take account of latest scientific and technological changes.
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International Involvement

ESA, representing Ethiopia, is a member of the International Organization for Standardization (ISO), and Codex Alimentarius Commission (CODEX). It also maintains close working relations with the international Electro-technical Commission (IEC) and American Society for Testing and Materials (ASTM).It is a founding member of the African Regional Organization for standardization (ARSO).

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